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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,420	04/04/2007	Joseph Kennedy	H0004729USA-4780	9127

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EXAMINER

ISAAC, STANETTA D

ART UNIT	PAPER NUMBER
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2812

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09/22/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/567,420	Applicant(s) KENNEDY ET AL.	
	Examiner STANETTA D. ISAAC	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/16/08 & 8/13/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the application filed on 4/04/07. Currently, claims 1-31 are pending.

Information Disclosure Statement

The information disclosure statements (IDS) were submitted on 4/16/08 and 8/13/09. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

1. Claims 28, 28, 29, 30 and 31 are objected to because of the following informalities: the following claims should read as follows:
2. In line 1, of the second duplicated claim number "28", should be deleted and renumbered as claim "29".
3. In line 1, of the numbered claim "29", should be deleted and renumbered as claim "30".
4. In line 1, of numbered claim "30", should be deleted and renumbered as claim "31"
5. In line 1, of number claim "31", should be deleted and renumbered as claim "32".

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6. Appropriate correction is required.

For the purpose of examination on the merits the Examiner's will view the above claims as the newly renumbered claims.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 10-12, 18, and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Allman et al (US Patent 5,100,503, hereinafter referred to as "Allman").
3. Allman discloses the sacrificial coating material and method as claimed. See the corresponding text, where Allman teaches, pertaining to claim 1, a sacrificial coating material comprising: at least one inorganic compound (col. 2, lines 55-58), and at least one material modification agent (col. 3, lines 39-45), wherein the sacrificial coating material is dissolvable in an alkaline-based chemistry or a fluorine-based chemistry (col. 5, lines 27-36).
4. Allman teaches, pertaining to claim 18, a method of producing a sacrificial coating material, comprising: providing at least one inorganic compound (col. 2, lines 55-58), providing at least one material modification agent (col. 3, lines 39-45), combining the at least one inorganic compound with the at least one material modification agent to form the sacrificial coating material (col. 6, lines 7-20), wherein the sacrificial coating material is dissolvable in an alkaline-based chemistry or a fluorine-based chemistry (col. 5, lines 27-36).

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5. Allman teaches, pertaining to claims 10 and 27, wherein the at least one material modification agent comprises at least one porogen, at least one adhesion promoter, at least one densifying agent, at least one leveling agent, at least one high-boiling solvent, at least one catalyst, at least one pH tuning agent, at least one capping agent or at least one replacement solvent (col. 3, lines 39-45, adhesion promoter).
6. Allman teaches, pertaining to claims 11 and 28, wherein the alkaline-based chemistry comprises an amine-based compound (col. 5, lines 27-36)
7. Allman teaches, pertaining to claims 12 and 29, wherein the amine-based compound comprises a primary amine, a secondary amine, a tertiary amine or a combination thereof (col. 5, lines 27-36).
8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-13 and 18-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Kennedy et al (US Patent 6,506,497, hereinafter referred to as “Kennedy”)

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

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inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Kennedy discloses the sacrificial coating material and method as claimed. See figures 1a-2h, and corresponding text, where Kennedy teaches, pertaining to claim 1, a sacrificial coating material comprising: at least one inorganic compound (col. 2, lines 22-45), and at least one material modification agent (col. 3, lines 23-35; col. 6, lines 37-45), wherein the sacrificial coating material **24** is dissolvable in an alkaline-based chemistry or a fluorine-based chemistry (figures 2d-2f; col. 8, lines 16-35).

Kennedy teaches, pertaining to claim 18, a method of producing a sacrificial coating material, comprising: providing at least one inorganic compound (col. 2, lines 22-45), providing at least one material modification agent (col. 3, lines 23-35), combining the at least one inorganic compound with the at least one material modification agent to form the sacrificial coating material **24** (2d-2f; col. 8, lines 13-35), wherein the sacrificial coating material is dissolvable in an alkaline-based chemistry or a fluorine-based chemistry (figures 2d-2f; col. 8, lines 16-35).

Kennedy teaches, pertaining to claims 2 and 19, wherein the inorganic compound comprises a silicon-based compound (col. 2, lines 22-45).

Kennedy teaches, pertaining to claims 3 and 20, wherein the silicon-based compound comprises at least one siloxane compound, at least one silazane polymer, dimethylsiloxane, diphenylsiloxane, methylphenylsiloxane, at least one silicate polymer, at least one silicic acid derivative, and mixtures thereof (col. 2, lines 22-45).

Kennedy teaches, pertaining to claims 4 and 21, wherein the at least one siloxane compound comprises methylsiloxane, methylsilsesquioxane, phenylsiloxane,

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phenylsilsesquioxane, methylphenylsiloxane, methylphenylsilsesquioxane or combinations thereof. (col. 2, lines 22-45)

Kennedy teaches, pertaining to claims 5 and 22, wherein the at least one silicon-based compound comprises at least one hydrogensiloxane polymer having the general formula $(H_{0-1}SiO_{1.5-2.0})_x$, at least one hydrogensilsesquioxane polymer having the formula $(HSiO_{1.5})_x$, where x is greater than about four and derivatives of silicic acid or a combination thereof (col. 2, lines 22-45).

Kennedy teaches, pertaining to claims 6 and 23, wherein the at least one silicon-based compound comprises copolymers of hydrogensilsesquioxane and an alkoxyhydrosiloxane or hydroxyhydrosiloxane (col. 2, lines 22-45).

Kennedy teaches, pertaining to claims 7 and 24, wherein the silicon-based compound comprises acrylic siloxane polymers, silsesquioxane-based polymers, derivatives of silicic acid, organohydrosiloxane polymers of the general formula $(H_{0-1}SiO_{1.5-2.0})_n(R_{0-1}SiO_{1.5-2.0})_m$, organohydrosilsesquioxane polymers of the general formula $(HSiO_{1.5})_n(RSiO_{1.5})_m$, where m is greater than zero and the sum of n and m is greater than about four and R is alkyl or aryl, and combinations thereof.

Kennedy teaches, pertaining to claims 8 and 25 wherein the organohydrosiloxane polymer comprises methylhydrosiloxanes, ethylhydrosiloxanes, propylhydrosiloxanes, t-butylhydrosiloxanes, phenylhydrosiloxanes and combinations thereof (col. 2, lines 22-45).

Kennedy teaches, pertaining to claims 9 and 26, wherein the silsesquioxane-based polymer comprises methylhydrosilsesquioxanes, ethylhydrosilsesquioxanes,

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propylhydridosilsequioxanes, t-butylhydridosilsequioxanes, phenylhydridosilsequioxanes, and combinations thereof (col. 2, lines 22-45).

Kennedy teaches, pertaining to claims 10 and 27 wherein the at least one material modification agent comprises at least one porogen, at least one adhesion promoter, at least one densifying agent, at least one leveling agent, at least one high-boiling solvent, at least one catalyst, at least one pH tuning agent, at least one capping agent or at least one replacement solvent (col. 3, lines 23-35; col. 6, lines 37-45, solvent).

Kennedy teaches, pertaining to claims 11 and 28, wherein the alkaline-based chemistry comprises an amine-based compound (col. 8, lines 4-15).

Kennedy teaches, pertaining to claim 12 and 29, wherein the amine-based compound comprises a primary amine, a secondary amine, a tertiary amine or a combination thereof (col. 8, lines 4-15).

Kennedy teaches, pertaining to claims 13 and 30, wherein the amine-based compound comprises TMAH (col. 8, lines 8-15).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 14-17, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allman et al (US Patent 5,100,503, hereinafter referred to as "Allman") as applied to claims 1 and 18 above, and further in view of Hussein et al (US Patent 6,365,529, hereinafter referred to as "Hussein").

13. Allman discloses the sacrificial coating and method substantially as claimed. See the above.

14. However, Allman fails to show, pertaining to claims 14 and 31, a transparent via fill coating layer comprising the material. In addition, Allman fails to show, pertaining to claims 15 and 32, wherein the layer is sacrificial. In addition, Allman fails to show, pertaining to claim 16, a layered material, comprising: the via fill coating layer, an absorbing composition layer, and a photoresist layer. Finally, Allman fails to show, pertaining to claim 17, wherein the layered material is coupled to a dielectric layer.

15. Hussein teaches, pertaining to claims 14-17 31 and 32, using a sacrificial material in via for dual damascene metal interconnects that include use of dielectric layer material, where the sacrificial layer is transparent (figures 1d-1c; col. 6, lines 18-41). In addition, Hussein provides the advantages of reducing the amount of light reflected from the underlying substrate and eliminating defects of the dielectric material.

16. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the following steps of: a transparent via fill coating layer comprising the material; wherein the layer

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is sacrificial; a layered material, comprising: the via fill coating layer, an absorbing composition layer, and a photoresist layer; wherein the layered material is coupled to a dielectric layer, with the sacrificial coating and method of Allman, pertaining to claims 14-17, 31, and 32, according to the teachings of Hussein, with the motivation of reducing the amount of light reflected from the underlying substrate and eliminating defects of the dielectric material allowing for a more efficient patterning process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STANETTA D. ISAAC whose telephone number is (571)272-1671. The examiner can normally be reached on Monday-Friday 9:30am -6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber can be reached on 571-272-2194. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stanetta Isaac
Patent Examiner
September 15, 2009

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/Charles D. Garber/

Supervisory Patent Examiner, Art Unit 2812